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**IN-026. Near Real Time Data for Earth Science and  
Space Weather Applications**

### **Near Real Time Tools for ISS Plasma Science and Engineering Applications**

Joseph I. Minow and Emily M. Willis  
*NASA, Marshall Space Flight Center  
Huntsville, Alabama USA*

Linda Neergaard Parker  
*Jacobs Technology, ESSSA Group, MSFC  
Huntsville, Alabama USA*

Ja Soon Shim  
*The Catholic University of America, Washington, DC USA  
and NASA, Goddard Space Flight Center  
Greenbelt, Maryland USA*

Maria Kuznetsova and Antti A. Pulkkinen  
*NASA, Goddard Space Flight Center  
Greenbelt, Maryland USA*

The International Space Station (ISS) program utilizes a plasma environment forecast for estimating electrical charging hazards for crews during extravehicular activity (EVA). The process uses ionospheric electron density and temperature measurements from the ISS Floating Potential Measurement Unit (FPMU) instrument suite with the assumption that the plasma conditions will remain constant for one to fourteen days with a low probability for a space weather event which would significantly change the environment before an EVA. FPMU data is typically not available during EVA's, therefore, the most recent FPMU data available for characterizing the state of the ionosphere during EVA is typically a day or two before the start of an EVA or after the EVA has been completed. In addition to EVA support, information on ionospheric plasma densities is often needed for support of ISS science payloads and anomaly investigations during periods when the FPMU is not operating.

This presentation describes the application of space weather tools developed by MSFC using data from near real time satellite radio occultation and ground based ionosonde measurements of ionospheric electron density and a first principle ionosphere model providing electron density and temperature run in a real time mode by GSFC. These applications are used to characterize the space environment during EVA periods when FPMU data is not available, monitor for large changes in ionosphere density that could render the ionosphere forecast and plasma hazard assessment invalid, and validate the assumption of "persistence of conditions" used in deriving the hazard forecast. In addition, the tools are used to provide space environment input to science payloads on ISS and anomaly investigations during periods the FPMU is not operating.